

SECTION 15641

INDUCED DRAFT COOLING TOWERS – STEEL

LANL MASTER CONSTRUCTION SPECIFICATION

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the LEM Mechanical POC.

When assembling a specification package, include applicable specifications from all Divisions, especially, Division 1, General Requirements.

Delete information within “stars” during editing.

Specification developed for ML-3 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Factory fabricated induced draft cooling towers – steel.

1.2 PERFORMANCE REQUIREMENTS

- A. Tower to operate at 7500 feet elevation.

Comply with the LANL Engineering Manual, Structural Chapter, for site-specific seismic criteria.

- B. Tower assembly to comply with the requirements of UBC seismic zone [2B] [4] construction.
- C. Do not exceed the following sound pressure levels, measured at grade level 50 feet from cooling tower:
 - 1. Hz/dB: 63/75, 125/72, 250/75, 500/71, 1000/60, 2000/60, 4000/49, 8000/40.
 - 2. Weighted average: 73dBA.

1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
 - 1. Catalog data.

2. Certifications that cooling tower performance, based on CTI 201, meets or exceeds specified requirements.
3. Installation instructions.
4. Performance curves for site-specific data, plotting entering water temperature and leaving water temperature against wet bulb temperature.
5. Operations and maintenance data.
6. Warranties.
7. Shop drawings.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the product specified in this section with minimum 5 years experience. Manufacturer must be a member of the Cooling Tower Institute.
- B. Materials:
 1. Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84.
 2. 100 percent asbestos free.

1.5 WARRANTY

- A. Warrant the entire tower, including the motor, against failure due to defects in materials and workmanship for a period of 5 years following shipment to the site.

PART 2 PRODUCTS

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

2.2 MANUFACTURER

- A. Marley Cooling Tower Co., Model NC [].

2.3 PERFORMANCE

- A. Capacity:
 1. Btu/h: [].

2. Water Flow: [] gpm.
3. Tower Water Supply Temperature: [75] degrees F.
4. Tower Water Return Temperature: [85] degrees F.
5. Entering Design Air WB Temperature: [65] degrees F.

2.4 PHYSICAL DATA

- A. Dry Weight: [] pounds.
- B. Operating Weight: [] pounds.
- C. Overall Dimensions: [] long, [] wide, [] high.

2.5 MANUFACTURED UNIT

- A. Provide unit for outdoor use, factory assembled, single cell, cross flow, vertical discharge, induced draft type, with motor.
- B. Cooling Tower Construction: Heavy gauge galvanized steel structural components, cold-water basin, basin covers, hot water basin, fan deck and fan cylinder. Components subject to factory welding shall be hot dipped galvanized after completion of fabrication.

Motor selection is based on tower operation, e.g., tower operating during winter season. Consult with tower manufacturer for motor selection. Size per LEM D30GEN, Motors

- C. Motor: Mounted outside of air stream [2 speed, 1800/900 rpm] [single speed, 1800 rpm] [constant speed, 1800 rpm with VFD] totally enclosed fan cooled (TEFC). Comply with Section 15170, Motors.
 1. [] hp.
 2. [] volts, 3 phase, 60 Hz.
- D. Fan: Multi-blade, cast aluminum, manual adjustable pitch.
 1. Fan Diameter: [] inches.
 2. Air Flow: [] cfm.
- E. Fan Drive: Right angle, industrial duty, oil lubricated, geared speed reducer equipped with an oil level sightglass and drive shaft. Speed reducers employing sheaves and belts are not acceptable.

- F. Fan Guard: One piece welded steel rod and wire guard, hot dipped galvanized after fabrication.
- G. Fill, Louvers, Drift Eliminators: 15 mil (0.015 inch) thick PVC fill sheet. Drift not to exceed 0.005 percent of circulated design gpm.
- H. Hot Water Distribution System: Provide basin covers and orifice type inert polypropylene nozzles that are easily removable and replaceable. Provide flow-control valves at inlet to each basin to permit flow balancing and maintenance shut-off to selected cells. Provide top dual inlet connections per cell.
- I. Cold Water Basin: Basin with water level controller, integral sump with openings for supply, return (with strainer), overflow, make-up water, and drain. Provide [Bottom] [Bottom depressed] [Side] outlet connection.
- J. Accessories:
 - 1. Electric Immersion Heaters: In cold water basin, suitable to maintain basin water temperature at 42 degrees F when outside temperature is minus 10 degrees F. Basin heater [] kW, [] volts, [] phase, 60 Hz.
 - 2. Safety fan deck railings conforming to OSHA standards.
 - 3. Ladder from [grade] [roof] to fan deck conforming to OSHA standards.
 - 4. Vibration Limit Switch: To break power circuit to fan motor in a situation of excess vibration, factory wired, manual re-set and field adjustable for sensitivity. Provide easy access to switch.
 - 5. Water Level Controller: Flygt Multi-trode (MTR) level sensor, control relay (120 volts) and interconnecting cable shall be furnished and installed by the tower manufacturer. The relay shall provide a control voltage for a solenoid valve to fill the basin (high/low sensor) and contacts for a high level alarm. This unit replaces the float valve in the cold-water basin.
 - 6. Variable Frequency Drive (VFD):

 Consult with project electrical engineer and refer to the LANL electrical standards for VFD requirements.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Connect tower water supply and return piping to tower. Pitch tower water supply piping to tower and water return piping away from tower.
- B. Connect make-up piping with isolation valve connection to tower. Pitch piping to tower.

- C. Connect overflow and drain piping to tower and route to floor drain. Provide an isolation valve in drain line.

3.2 CONTRACTOR'S FIELD SERVICES

- A. Fill system with water.
- B. Check and fill gear drive with oil as recommended by manufacturer.
- C. Rotate fan assembly and gear drive weekly from time of arrival to start-up.
- D. Verify operation of water temperature controls.

3.3 MANUFACTURER'S FIELD SERVICES

- A. Check, test, and start-up tower in presence of LANLs operating personnel.
- B. Instruct LANLs operating personnel in operating and routine maintenance procedure. Schedule a minimum of 4 hours training during normal working hours.

END OF SECTION